In The Specification

In response to the Office action of 7/22/02, please amend the above-dentified aplication as follows, in response to, and to fully and completely comply with, the Examiner.

Please amend the cited U.S. PATENT DOCUMENTS on page 3 as follows:.

Please add to the U.S. PATENT DOCUMENTS on page 3 the following additional references.

B1

U.S. PATENT DOCUMENTS

Serial number	Filing Date	
07/339,976	04/18/1989	Swartz, M.
07/371,937	06/27/1989	Swartz, M.
08/406,457	03/20/1995	Swartz, M.
09/573,381	05/19/2000	Swartz, M.

Please replace the OTHER PUBLICATIONS listed on page 4 as follows:

B2 cont.

J. O'M Bockris, K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970).

C. A. Hampel, Rare Metals Handbook, Reinhold Publishing Corp, (1954).

M. Hansen, Constitution of Binary Alloys, McGraw-Hill Book Co., Inc. (1958).

J. R. Melcher,, "Continuum Electromechanics", MIT Press, Cambridge, (1981).

C. J. Smithells, Metals Reference Book, Butterworths Scientific, (1949).

H. H. Uhlig, Corrosion and Corrosion Control, John Wiley & Sons, Inc., (1971).

M. Swartz, "Quasi-One-Dimensional Model Of Electrochemical Loading Of Isotopic Fuel Into A Metal", Fusion Technology, 22, 2, 296-300 (1992).

M. Swartz, (1994A) "Isotopic Fuel Loading Coupled To Reactions At An Electrode", Fusion Technology, 26, 4T, 74-77.

M. Swartz, (1994B) "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", EPRI and Office of Naval Research.

B2 Concld.

M. Swartz, "A Method To Improve Algorithms Used To Detect Steady State Excess Enthalpy", Transactions of Fusion Technology, 26, 156-159 (1996).

M. Swartz, "Consistency Of The Biphasic Nature Of Excess Enthalpy In Solid State Anomalous Phenomena With The Quasi-1-Dimensional Model Of Isotope Loading Into A Material", Fusion Technology, 31, 63-74 (1997A).

M. Swartz, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", Journal Of New Energy, 1, 4, 26-33 (1997B).

M. Swartz, "Codeposition Of Palladium And Deuterium", Fusion Technology, 32, 126-130, (1997C).

M. Swartz, Improved Electrolytic Reactor Performance Using π-Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85 (1998A).

M. Swartz, "Patterns of Failure in Cold Fusion Experiments, Proceedings of the 33rd Intersociety Engineering Conference on Energy Conversion, IECEC-98-I229, Colorado Springs, CO, (1998B).

A. Von Hippel, "Dielectric Materials and Applications", MIT Press, (1954)

A. Von Hippel, D.B. Knoll, W.B. Westphal, "Transfer Of Protons Through 'Pure' Ice I_H Single Crystals", J. Chem. Phys., 54, 134, (ALSO 145), (1971).

Please replace the Paragraph 4, page 3, with the following:

B3

The present invention relates to electrochemical reactions in or about metals, such as palladium which has been electrochemically loaded with deuterium, but it has relevance as well, to hydrogen loading, nuclear fusion, and other reactions in loaded metals such as titanium or palladium filled with deuterium, and to the broader field of metallurgy and engineering in or about metals, including Groups IVb, Vb, and some rare earths.

Please replace paragraph 1 on page 10 with the following:

Figure 1 symbolically shows the compartments used to analyze an electrochemical reactor. Figure 1 gives organization to the different parts of a simple reactor referred to in this disclosure. It is not meant to be physically realistic with respect to size. The cathode is dissected into four regions. Three compartments are shown within the metal itself. The flow of deuterons is shown by arrows. The label 1 represents the metallic cathode, usually palladium in the preferred configuration. The labels 2 and 3 represents compartments 2, and 3 respectively, which are discussed in detail below. The label 7 represents the anode which in the preferred embodiment is composed of palladium. The label 6 represents the solution consisting in the preferred embodiment of a gel containing antidesiccant, in combination with LiOD, palladium salts, and heavy water (D_20). The power supply and control unit uses a current source as described in Swartz (1989), and are not shown in the figure. For simplicity, the electrical connections, heat removing apparatus, and several improvements described in this disclosure are not shown in figure 1.

B4

Paragraph 1, on page 11 has been amended with the following:

Classically, an electrode in a deuteron solution at equilibrium should measure potentials associated with the Nernst equation. However, during the reaction, the system is not at equilibrium. Therefore, a quasi-1-dimensional model can be used to describe the situation external to the cathode [Swartz, M., 1992, "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", Fusion Technology, 22, 2, 296-300; Swartz, M., 1994A, "Isotopic Fuel Loading Coupled To Reactions At An Electrode", Fusion Technology, 26, 4T, 74-77; Swartz, M., 1997C, "Codeposition Of Palladium And Deuterium", Fusion Technology, 32, 126-130 (1997)].

B5

Please replace the second paragraph on page 11 with the following:

Coupled equations thus determine the distribution of deuteron species in the bulk solution. K_f is the bulk rate of the desired reactions. K_c is the rate at which deuterons physically enter the palladium cathode. B is the diffusivity of the isotopic fuel loaded into the material. I, A and F are the electrical current, area, and the Faraday. [D+] is spatially and time variant.

B6

Please replace the second (last) paragraph on page 13 with the following:

This occurs until, by a second catastrophic process, the fusion-defect-site is no longer confined [Swartz. M., 1994B, "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", EPRI and Office of Naval Research; Swartz, M., 1997B, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", Journal of New Energy, 1, 4, 26-33]. The final reactions in the CAM theory ends with the opening up of the defect or fissure through a large crack (compartment 3). By this theory the fissures are the result of the catastrophic desaturation of the active medium that was previously fully deuterated (e.g. in the preferred embodiment palladium or titanium).

B7

Please replace the last paragraph on Page 19 (continuing as first paragraph on Page 20; changes on page 20 lines 9-11) with the following:

The reactions of deuterium continue until the crystalline palladium (the active medium because of its high fractional saturation and its exothermic desaturation tendency) is spent of its deuterons or until, by a second catastrophic process, the fusion-defect-site is no longer confined. At that point, catastrophic exposure of compartment 2 to the ambient occurs creating compartment 3. The intracathodic compartment 3 of the CAM theory is known from endstage deuteron (or hydrogen) embrittlement. This compartment usually declares itself when the dissolved deuterons, after entering a metal through a corrosion reaction or by cathodic polarization, explode into the ambient as the metal fissures or otherwise irrefutably changes shape. The calculated fugacities involved are enormous ranging from 5000 up to an estimated 10^7 atmospheres for hydrogenated palladium [Bockris]. --

B8

Please replace the second paragraph on Page 21 with the following:

This type of system, coupled with the FUSOR (JET Energy Technology, P.O. Box 81135, Wellesley Hills, MA) drive system or its equivalent [Application '976; Swartz, M., 1997A, "Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena with the Quasi-1-Dimensional Model of Isotope Loading into a Material", Fusion Technology, 31, 63-74; Swartz, M., 1998A, Improved Electrolytic Reactor Performance Using π-Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85], is capable of filling the cathode with deuterium from the solution. However, the deuterated metals could also be filled by codeposition of deuterium and palladium, or by high pressure deuterium gas.

B9